We claim:

1. An optical network for the transfer of data between optical network units (ONU) connected to respective data terminal equipment including electro-optical interface for converting electrical signals to optical signals for transmission through the optical network and for converting optical signals to electrical signals for input to the terminal equipment, comprising:

a) a fiber optic line having first and second ends;

b) first and second point-of-presence (POP) units connected to respective first and second ends of said fiber optic line, said first and second POP units for being connected to another optical network, said first and second POP units including optical multiple wavelength apparatus for optical signal generation and optical multiple wavelength apparatus for optical signal detection;

c) first and second optical communicators connected to said fiber optic line at locations either between said first and second POP units or attached to the same or different POP units;

d) first and second ONUs operably connected to respective said first and second optical communicators, said first and second ONUs being associated with respective first and second data terminal equipment;

e) said first optical communicator being configured to transmit a first wavelength signal bi-directionally from said

first ONU to both said first and second POP units, said first optical communicator including a first add/drop module operably connected to said fiber optic line to drop a second wavelength signal from said fiber optic line intended for said first ONU;

f) said second optical communicator being configured to transmit a third wavelength signal bi-directionally from said second ONU to both said first and second POP units, said second optical communicator including a second add/drop module operably connected to said fiber optic line to drop a fourth wavelength signal from said fiber optic line intended for said second ONU;

g) said first and second ONUs each including optical multiple wavelength apparatus for optical generation and optical wavelength apparatus for optical detection; and

h) control system means for allocating wavelengths between said first and second ONUs and said first and second POP units.

2. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation for said ONUs includes a broad spectrum optical source; and

b) a channel defining assembly for resolving the output of said broad spectrum optical source.

3. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation said ONUs includes multiple laser sources.

4. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation for said ONUs includes a WDM laser source.

5. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation for said ONUs includes a tunable laser source.

6. An optical network as in claim 1, wherein said optical multiple wavelength apparatus for optical detection for said ONUs includes a WDM receiver.

7. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation for said POP units includes a broad spectrum optical source; and

b) a channel defining assembly for resolving the output of said broad spectrum optical source.

8. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation said POP units includes multiple laser sources.

9. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for optical generation for said POP units includes a WDM laser source.

10. An optical network as in claim 1, wherein:

a) said optical multiple wavelength apparatus for

optical generation for said POP units includes a tunable laser source.

11. An optical network as in claim 1, wherein said optical multiple wavelength apparatus for optical detection for said POP units includes a WDM receiver.

12. An optical network as in claim 1, wherein each of said first and second optical communicators comprises:

a) a first coupler connected to said first and second add/drop modules and a respective ONU;

b) a second coupler connected to said first coupler;

c) third and fourth couplers connected to said fiber optic line at locations outboard of said first and second add/drop modules;

d) said second coupler is connected to said first and second fourth couplers;

e) wherein said first or second wavelength signal from said first or second ONU, respectively, passes through said first coupler and splits at said second coupler to proceed to respective said third and fourth couplers to respective said first and second POP units;

g) wherein said second wavelength signal in said fiber optic line intended for said first ONU is dropped by one of said first and second add/drop modules and sent to said first coupler and then to said first ONU; and

h) wherein said first wavelength signal in said fiber optic line intended for said second ONU is dropped by one of

said first and second add/drop modules and sent to said first coupler and then to said second ONU.

13. A network as in claim 12, wherein said first and second add/drop modules include variable wavelength filters.

14. A network as in claim 12, and further comprising:

a) a tap connected to said fiber optic line between said first and second add/drop modules; and

b) a WDM photodetector connected to detect wavelengths passing between said first and second add/drop modules, thereby to monitor the wavelengths passing through said fiber optic line.

15. A network as in claim 12, wherein:

a) said first and second add/drop modules include first and second circulators, respectively;

b) said third and fourth couplers include first and second tunable wavelength division multiplexers, respectively; and

c) said first coupler includes a bi-directional tunable wavelength division multiplexer.

16. A network as in claim 1, and further comprising a star coupler connected between said first or second optical communicator and said first or second ONU.

17. A network as in claim 1, and further comprising a switch coupler connected between said first or second optical communicator and first or second ONU.

18. A method for transferring data between a first optical network unit (ONU) to a second ONU, comprising:

a) providing a fiber optic line between first and second point-of-presence (POP) units;

b) connecting first and second optical communicators to the fiber optic line at locations between the first and second POP units, each optical communication including an add/drop module;

c) connecting the first and second ONUs to the respective first and second optical communicators;

d) designating one of the first and second POP units to be a primary POP unit for the first ONU; and

e) assigning a wavelength to be used by the first ONU to transmit data signal to the second ONU;

f) adjusting the add/drop module of the second optical communicator to drop the data signal at the assigned wavelength to the second ONU;

g) sending the data signal on the assigned wavelength through the first optical communicator whereby the data signal is sent to both the first and second POP units through the fiber optic link; and

h) informing the primary POP unit that the assigned wavelength is no longer needed.

19. A method as in claim 18, wherein said assigning comprises:

a) requesting permission from the primary POP unit to

transmit data signal to the second ONU; and

b) granting to the first ONU permission to use the assigned wavelength to transmit the data signal.

20. A method as in claim 18, wherein said assigning comprises:

a) providing a first control channel for use by the first ONU for requesting the particular wavelength from the primary POP unit; and

b) providing a second control channel for use by the primary POP unit for granting use of the particular channel to the first ONU.

21. A method as in claim 18, wherein said assigning comprises:

a) providing a first control channel;

b) writing by the first ONU on the first control channel a token indicating which wavelength it wishes to use;

c) providing a second control channel indicating the status of the requested wavelength; and

d) using the requested wavelength if available to transmit the data signal.

22. A method as in claim 18, wherein said assigning comprises:

a) listening by the first ONU with a WDM receiver to all wavelengths in the fiber optic line; and

b) selecting a free wavelength to transmit the data signal.

23. A method as in claim 20, wherein the first and second control channels are operated in time division mutliplexing mode.

24. A method as in claim 20, wherein the first and second control channels are operated in time division multiple access mode.

25. A method as in claim 18, wherein the first and second optical communicators are implemented with variable wavelength filters.

26. A method as in claim 18, wherein the first and second optical communicators are implemented with circulators and tunable wave division multiplexers.